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NEWS OF UKRAINIAN ACADEMY OF SCIENCES

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FOREWORD

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NEWS OF UKRAINIAN ACADEMY OF SCIENCES

[Following are the translations of selected articles from Dopovide Akademiy Nauk Ukrayns'koy RSR, (Reports of the Academy of Sciences Ukrainian SSR), No 7, 1960.]

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THE NEWS OF THE PRAESIDIUM OF THE ACADEMY OF SCIENCES
OF THE UKRAINIAN SOCIALIST SOVIET REPUBLIC

- USSR -

Following is a translation of an Ukrainian unsigned article in Dopovid AN URSR [The Notices of the Academy of Sciences of the Ukrainian Socialist Soviet Republic], No 7, Kiev, 1960, pp. 984-988.

1. On the Work and Future Research Trends of the Microbiological Institute of the Academy of Science of the Ukrainian SSR.

The Praesidium of the Ukrainian Academy of Science heard and discussed a speech by the Director of the Institute, the Academician of the Ukrainian Academy, V. H. Drobetko, who spoke on the activity of the Institute.

The Praesidium stressed, that in the postwar period, the Institute directed significant work, which resulted in a number of valuable results, both from a theoretical and a practical point of view, in particular, on the study of inter-relationship between microorganisms and higher plants, microflora, risosphere of farm plants, mushroom - stimulant mycotoxicosis, heredity and instability of microorganisms and anaerobiosis of bacteria, specially with reference to antibiotics from fungi, higher plants, and others. The results of those works are to be found in over thirty published monographs and specialized collections. The following antibiotics were obtained and introduced: microcide, imanin, bacterial fertilizers from derivatives of a nitrogen bacterium K, and no. 28. We also discovered an antibiotic called arenarin for use against bacterial diseases of tomatoes, and a bacterial fertilizer from the bacterium Pseudomonas sindoz; also bacteria able to convert a butyl ferment into nondrinkable rough alcohol, and so on.

The Institute occupies a prominent position in the USSR in the Radgan'skiy Soyuz in the branch of phytonocides and coordinates, in the Ukraine, the research on the problem of inter-relation between microorganisms and higher plants, and the search for and the assimilation of antibiotics and brucellosis.

The Institute conducts its work in close cooperation with a number of scientific research institutes and production organizations in farming, industry, and medicine.

In connection with this, the Praesidium was told that there have been some shortcomings in the activity of the Institute. Up till now, insufficient research is being done in virology, antibiotics from microorganisms and antinomicites. There does not exist sufficient diversity of scientific work of some branches, and laboratories. Those cases delay the introduction of the results of scientific research. In recent years the popularizing of science by the Institute has become much more feeble. The management and the scientific council of the Institute have paid insufficient attention to the selection and preparation of the young scientific cadres, and more than a half of junior scientific workers do not have their PhD's (14 out of 22). The planned doctoral theses are completed too late.

The Praesidium of the AN URSR has ordered the management and the scientific council of the Microbiological Institute to put in effect the following:

a/ to direct the scientific research effort towards the solving of problems in biochemistry, physiology, and to systematize the microorganisms, especially under the action of ionizing radiations, to know the microorganisms present in the soil of the Ukrainian SSR, and to find phytopathogenic bacteria of the main farm plants.

b/ to conduct research and selection of new active microorganism forms, in order to improve the existing ones and to create new branches of industry, where these microorganisms will be used.

c/ to intensify the search for and the knowledge of new antibiotics and biologically active substances for use in medicine, farming, especially for virus diseases of plants.

d/ to prepare a diversified range of research to find the microorganisms present in the soil of the Ukrainian SSR; this to be done by the branches, which work on this problem.

e/ to accelerate the scientific-research verification of recommendations worked out by the Institute, together with a method of fast dissemination of the results on a nationwide scale.

f/ to discuss the problems of training, placing and later preparation, location and the improvement of the scientific personnel.

g/ to increase appreciably the general knowledge of the activities of the Institute, to connect it with the activity of the Ukrainian Society of Microbiologists and the Society for the Propagation of Scientific and Political Sciences.

2. An Account of the Work of the Publishing and Printing Council (RVR), and the Publishing House of the Ukrainian Academy of Science during the Year 1959.

The Praesidium of the Ukrainian Academy heard and discussed a report of the director of the RVR of the Academy, the Academician, M. F. Huloh, on the activity of the RVR and the Publishing House of the Ukrainian Academy in 1959.

The Praesidium emphasized the fact that, during the last period,

RVR devoted appreciable attention to the reconstruction of the Academy's publishing activity according to the decisions of the 21st Congress of the Communist Party of the Soviet Union, especially in improving the topics and the amount of publications and to use more polygraphic reproductions.

During the year 1959, 447 titles were published. Amongst the 1959 publications there is a number of important monographs, namely:

Shevchenko's Satire, by Yu. O. Ivakin, Ukrainian Revolutionary Democratic Journalism, by O. I. Deya, Ukrainian Literary Criticism of the 1850-1870 Period, by M. D. Bernshtein, Fragments from the History of the Ukrainian Soviet Film Art, in three volumes The Ukrainian Dramatic Theater, two volumes by S. Vasil'chenko and two volumes by P. Hrabov's'ki, The History of Kiev, part 1, Albania in Russian and Ukrainian Literatures in the Period from the 15th to the 20th Century, by P. M. Popov, Selected Works of O. H. Shlihtev, in one volume, A Sketch of Socio-Political Regime of the Left Dnieper Bank Ukraine at the end of the 17th and beginning of the 18th Century, by V. A. Dyadichenko, Political and Economical Ties of the Ukraine with Russia in the Middle of the 17th Century, by P. P. Shevchenko, The Outlines of the Agrarian Revolution in Russia, by P. M. Pershin, The Industrial Development of the Ukraine, by O. O. Nesterenko, Agricultural Conditions in Galitzya, by M. P. Herasimenko, Philosophical Problems of Teaching of Modern Physics, through the Structure and the Properties of Matter, by O. V. Shuhailin, The Inspired Philosophical Work of V. I. Lenin, a collective work of authors from the Institute of Philosophy, Outlines of History of the Penal Code of the Ukrainian SSR, by P. P. Mihailenko, The Chemistry of Biological Oxidation and the Synthesis of Fats and the Problem of Increasing the Fat and Milk Content, by M. F. Huloh, The Exchange of Purines in the Tissues of Healthy and Bloated Animals, by V. P. Korotkoruchko, Outline of the History of Physiology of the Ukraine, Ukrainian Fauna, part 7, Selected Works in one volume of M. M. Huberhrits, Scientific Foundations of Solution and Regulation of Thermal Pattern of Deep Shafts, part 1, by O. N. Shcherban and O. O. Krn'ov, The Theory of Filtration under Hydrotechnical Structures, part 1, by P. F. Fil'chakov, Tensions in Gravitation Dams on non-Rock Foundations, by L. I. Dyatlovits'ki, Complete Collection of Works in three volumes of M. V. Ostrograds'ki, Colloidal Metals, part 1, by E. M. Natanson, Silicates and their Application in Technology, by H. V. Samsonov, Silicon and its Binary Systems, by A. S. Bereznyi, The Geology of Iron-Silicon Formations of the Ukraine, by M. P. Semenenko et al., The Geology of Ukraine, by V. H. Bondarchuk, etc.

The Praesidium stressed that an important event in the life of the Ukrainian Academy, is the publishing of Russian-Ukrainian terminological dictionaries: physics, chemistry, mining, geology, machine science, and machine construction.

The activity of the Publishing House of the Academy has somewhat improved in 1959, the polygraphic techniques of publication has improved, a new printing plant in Feofania was opened, a more modern

method was introduced for preparing a book for printing from an original as pattern and from a first proof.

Then the Praesidium stated that the Academy Publishing House did not fulfill the publishing plan for 1959 to the extent of 13% of printed sheets and 43.3% of publications. The fundamental reason for nonfulfillment of the plan for 1959 was a bad preparation of manuscripts by the Institutes, which caused frequent changes in the galley proofs, unsatisfactory organization of work in the printing plants and also in the capacity of the existing type-setting and printing presses.

The work of the RVR still contains a number of bad features. The RVR office exercises insufficient control over the quality of manuscripts, allows additions to be made in the incomplete manuscripts, which are submitted by the institutes. As a result of this the plans for publication become impossible.

The publisher is still dissatisfied with the method of distributing scientific literature through the official book retail organizations of the Republic.

The Praesidium of the Academy has approved the report on the work of the RVR and Academy Publishing House for 1959, emphasizing the insufficient management and organization of work of the Publishing House.

The Praesidium also drew the attention of the RVR and the office of the branches of the Academy to the necessity of improving the preparation of large general monographs similar to the proceedings of the 21st Congress of the CPSU and the 20th Congress of the Ukrainian Communist Party, specially in the field of nuclear physics, semi-conductors, polymer chemistry, the automation of production, works on current problems of the gradual transformation from socialism to communism.

The RVR, the office of the branches, the directors of institutes and scientific agencies of the Ukrainian Academy are compelled to include into the publication plan for next year, only completely ready-to-print manuscripts, which should be submitted to the Publishing House before 1 October. Those which can not be submitted before that date are not to be included in the plan.

3. Development of Scientific Research in Astronomy in the Ukrainian Academy of Science.

The Praesidium has heard and discussed the report of Ye. P. Fedorov, PhD. (mathematico-physical sciences), the Director of the Main Astronomical Observatory (MAO). It dealt with the status and the developmental possibilities of scientific research in astronomy in Ukrainian Academy.

The Praesidium stated that the MAO, during its existence, undertook important investigations in basic and photographic ASTROMETRY, the physics of the sun, the study of the shape and the motion of the

moon, and the photometry of the stars.

The gravimetric observatory of Poltava has achieved appreciable success in the study of the orbital motion and the deformation of the earth.

As yet the astronomy research within the Academy has not become sufficiently well known; in overall reckoning, the Ukrainian Academy remains behind some other republic academies.

The development of research in astronomy in Ukrainian Academy was to a large extent hindered by the fact that the observatories had no opportunity to receive equipment and instruments, which are necessary for a wide range of research. The construction of the MAO did not follow a general plan, but rather mainly followed a policy of small additions of temporary buildings in order to satisfy immediate needs.

In order to ensure a wide range of scientific research in astronomy in Academy, the Praesidium has instructed MAO and the gravimetric observatory of Poltava (PGO) to direct the efforts to solve the most important astronomical problems dealing with the conquest of space. The Praesidium also has approved the following basic program for the coming year:

in astrometry and celestial mechanics -- the study of kinematics and dynamics of the Earth-Moon system (MAO),

in astrophysics -- the study of nonstationary processes in the atmospheres of the sun and the stars, the study of the structure of the Milky Way and the study of the physical conditions on the moon and other planets (MAO).

The Praesidium has also provided for the inclusion in the plans such works as were approved by the astronomy council of the Ukrainian Academy:

the formulation of a method for establishing a coordinate system for observations on the surface of the moon (MAO),

the construction of a fast acting device which would automatically determine the coordinates and the brightness of stars from astronegatives (MAO and the Computing Center of the Ukrainian Academy).

The Praesidium of Academy has approved a number of appropriations in order to ensure the carrying out of the proposed investigations.

4. The Resume of Investigations within the Program of the International Geophysical Year (IGY) in the Ukraine.

The Praesidium of Ukrainian Academy of Science heard and discussed a report of the Head of the organization committee on execution of the IGY Program in the Ukraine, the Academician, V. H. Bondarchuk,

The Praesidium stressed the fact that the organization committee, in the years 1957-1959, has performed important work in coordinating the investigations of 17 scientific installations spread over the territory of Ukraine, which have performed a broad and serious series

of investigations connected with the study of various geophysical and astronomical phenomena.

The organization committee (OC) has performed a huge organization and preparatory work in the building of new observatories, stations, laboratories, pavillions, and observation points. Much new equipment was introduced in the form of high precision equipment and instruments. Ukrainian scientists have constructed new and original equipment and machines, which permitted the execution of research on an up-to-date scientific and technical level.

The results of the research obtained by Ukrainian scientists during IGY were made public during all-Union meetings and conferences on the 5th International Conference of the Soviet Committee of the IGY in 1958 (Moscow), during the International Astronomical Congress in Moscow, etc. The OC, organized four all-Ukraine conferences, where the results of research on various problems were discussed.

The results of the investigations carried out within the IGY program were often to be seen in Ukrainian and in Union publications. The OC published two issues of an IGY Information Bulletin, has prepared for publication the third and the fourth issues, in which there the reports read during the third and fourth Ukrainian Conferences are to be published.

The OC has established contact with some foreign observatories (England, Hungary, and others) and conducted an exchange of data which permit a more complete explanation of the nature of various geophysical phenomena.

The Praesidium of Ukrainian Academy has approved the activity of the OC during the IGY, and has commended its successful work.

5. The Activity of the Committee for the Coordination of Scientific Activity on the Problem "Semiconductors and their Applications".

The Praesidium of Ukrainian Academy has heard and discussed a report of V. Ye. Lashkar'ov an Academician of Academy, on the work of a committee for the coordination of scientific activity connected with the problem "Semiconductors and their Applications" for the year 1959.

The Praesidium has noted that the commission has carried out a large amount of work, three plenary sessions were held on the coordination of work. The first plenary session in January 1959 in Kiev discussed and approved a plan for scientific work during the year 1959 for the Ukraine and a tentative plan of scientific work for the period 1959-1965. The second extended plenary session in July 1959 in Odessa was devoted to the discussion of the results to problems of photoelectric and optical phenomena in semiconductors. In addition to this the plenum heard and discussed a report of the Institute of Physics of Odessa State University. The third plenary session in December 1959 in Kiev discussed a preliminary resume of works

performed in 1959 and a plan for 1960.

The solution to the problems was undertaken by the Institutes of Physics, Metals and Ceramics, and special ones, such as the Physical Chemistry Institute of the Ukrainian Academy, 14 Institutes of Higher Learning of the Ukrainian SSR, and the Institute of Automation of the Ukrainian Gosplan; all of these have obtained a number of results in the solution of problems, both of a theoretical and a practical nature.

The committee has worked out a tentative plan for scientific research on semiconductors for the period 1959-1975 in the Ukrainian SSR.

In connection with this, the Praesidium has stated that the extent of work on semiconductors in the Ukraine so far, has not reached the required dimensions, the work is developing slowly and the contribution to them by the Ukrainian scientists, in comparison with the rest of the USSR, is altogether insufficient. This is explained by the absence of well equipped and sufficiently developed scientific centers on semiconductors within the system of the Ukrainian Academy, of branch scientific research institutes on semiconductor uses, and also of a research institute on the application of semiconductors. The Praesidium of Ukrainian Academy has adjudged as satisfactory the work of the committee on the coordination of scientific activity connected with the problem of semiconductors and their applications.

6. The Decisions of the Coordination Council (CC) on the Problem: "Polymers".

In connection with an appreciable extension in the range of activity of the CC on the problem "The Scientific Foundations of Obtaining of High Molecular Compounds, Monomers and Intermediate Substances" and also the necessity of the extending the work into the branch of physics, technology, and the machining of polymers according to the recommendations of the First Ukrainian Republic Scientific - Technical Conference on the problems of utilization of plastics in machine construction and equipment construction, and the Third Ukrainian All-Republic Coordination Conference on the problem of "Production of Polymers and Monomers", the Praesidium of Ukrainian Academy of Science has adopted a motion to change the coordination committee into a CC on the problem "Polymer".

The Praesidium has approved that the personnel of the CC will consist of 28 members. The head of the CC was approved to be K. A. Korniyev PhD (chemistry), the vice directors V. C. Gutiryu an Academician of the Academy of the Azerbaidzhan SSR, V. H. Zashkvara, PhD (technology) the director of the Ukrainian NDI /Scientific Research Institute/ of polymers V. H. Uhinov, and the scientific secretary to be Z. N. Pazenko PhD (chem). The approved office of the CC consisted of the above and O. O. Nesterenko a corresponding

member of the Ukrainian Academy, and F. P. Belyankin, and Academician of the Ukrainian Academy.

The following sections were approved to be the part of the CC: the utilization of chemical byproducts of a dry distillation of coking coal for the extraction of intermediate products and monomers, under V. H. Zashkvara; the utilization of natural inflammable gases and crude oil for the source of monomers under V. C. Gutirya; the synthesis of monomers and polymers, under K. A. Korniyev; polymer technology, under V. I. Uhinov; physical-mechanical testing of polymer materials, under F. P. Belyankin; physical-chemical research on polymers, under R. V. Voitsehovskii; economic research, under O. O. Nesterenko.

7. The Approval of the Plan for Acceptance to Candidacy for the year 1960.

The Praesidium of Ukrainian Academy of Science has approved a plan for accepting to candidacy for the year 1960: in institutes and specialties, 250 members with severance from production and 50 members without severance from production.

In connection with this, the Praesidium has compelled directors of institutes and scientific research establishments to appoint within a month, directors of admission of aspirants for 1960, in every plan specialty, to establish contact with the corresponding nonacademic scientific establishments for the purpose of preparing aspirants in specialties in which the Ukrainian Academy has not highly qualified leaders nor the necessary material and technical basis. Taking into account the great neglect which has taken place last year in the selection of candidates to become aspirants, it is imperative to begin immediately with the organizational work on the selection of suitable candidates and to establish for this purpose a close cooperation with establishments and institutions, branch scientific research institutes, government agencies, institutes of higher learning, to travel to places to take active part in the careful selection of distinguished candidates to become aspirants, to put in general practice the acceptance of persons to become aspirants who have already taken their candidacy minimum, and to provide that the aspirants should have more time for quality scientific work.

As the next academic year begins early, acceptance to aspirancy shall be completed by the 1st of October 1960 in all academic establishments.

8. The Construction of New Branches and Laboratories.

1. In connection with intensified scientific research on metals and alloys with the application of ultrasonic and neutron-graphic methods and the study of properties of metals and alloys on loading at

high temperatures, the Praesidium of the Ukrainian Academy has adopted a motion to organize within the Physics of Metals Institute of the Ukrainian Academy, an ultrasonics physics laboratory, which would undertake investigations on the acoustic properties of rare and hard metals and alloys as a function of the physical state; to obtain very strong ultrasonic beams and the perfection of ultrasonic methods and alloys; the solution of problems connected with the introduction of ultrasonic methods into scientific research routine and factory laboratories; the development of ultrasonic technology and the production of alloys with improved physico-mechanical characteristics for new technologies.

I. H. Polots'kii PhD (chem). was nominated for the acting director of the ultrasonics laboratory.

In the Institute of Metal Physics there was organized a laboratory for investigating the metal creep, delegating to it the study of the crystalline structure and the microstructure of changes in the deformation process and of deterioration of metals at high temperatures, and also the study of the influence of the finished structure on the process of deformation and deterioration.

The directorship of this laboratory was delegated to the vice-director of scientific work of the Institute, H. Ya. Kozars'kii PhD (phys-math sciences).

2. In order to intensify photosynthesis research, the Praesidium of Ukrainian Academy decided to build a subbranch of photosynthesis in the Institute of Botany of Ukrainian Academy.

THE FIRST ALL-REPUBLIC SCIENTIFIC TECHNICAL CONFERENCE
ON THE PROBLEMS OF THE USE OF PLASTICS IN
MACHINE AND TOOL CONSTRUCTION

Following is the translation of an article by V. F. Yatsenko in Dopovidi AN URSR, No 7, Kiev, pp. 989-993.

The conference took place in Kiev from the 30th November to 3rd December 1959. It was organized by the State Scientific-Technical Committee of the Council of Ministers of the Ukrainian SSR and the Ukrainian Academy of Sciences, together with the Kiev Regional Authority of the Scientific Technical Society of the Machine Building Industry, the Institute of Construction Mechanics of Ukrainian Academy, the Scientific Research Institute of the City and Fuel Industry of the State Institute of Planning of the Ukraine, the Society for Propagation of Scientific and Political Sciences of the Ukraine, the Kiev City Building of Scientific Technical Propaganda and the Ukrainian Republic Authority of Scientific-Technical Society of the Tool Construction Industry.

The activities of the Conference were controlled by an organization committee under the aegis of F. P. Belyakin, Academician of Ukrainian Academy.

Taking part in the Conference were 960 delegates from 261 industrial plants, 91 from scientific research institutes, 26 from design-construction and technological establishments, 24 from institutes of higher learning and other establishments of the Ukrainian SSR, the Russian Soviet Federal Socialist Republic, the Belorussian, Moldavian, Latvian, Lithuanian, and the Armenian Soviet Republics. There were also delegates of the Moscow Municipality, Leningrad, Sverdlovsk, Perm, Moldava, and other cities. From the Ukraine there were representatives of the Ukrainian Institute of Planning, the State Scientific-Technical Committee of the Ukrainian Council of Ministers, and Ukrainian Academy, the Kiev, Stalino, Lvov, Kharkov, Dniepropetrovsk, Zaporozhe and Luhan municipalities, 126 industrial establishments, 60 scientific-research, design-construction, and technological institutes and 13 institutes of higher learning. The work of the conference was conducted in three plenary sessions and three section meetings: the physico-mechanical section on the properties of plastics, the section on the applications of plastics in technology, and the section on methods and equipment for the working of plastics.

In these plenary and sectional meetings, 60 papers and short announcements were made, out of which 21 dealt with physico-mechanical

problems of the properties of plastics, 27 were on the utilization of plastics in technology, 18 were concerned with machining of plastics and their production.

The first address of the conference was made by F. P. Belyakin, Academician of the Ukrainian Academy.

The representative of the Institute of Planning, P. S. Savchenko, in a report entitled "The Development of Manufacture of Goods from Plastics for the Machine and Tool Construction Industry in the Light of Decisions of the 21st Convention of the Communist Party, of the May and June Plenary Sessions of the Central Committee of the Communist Party" analyzed the state of preparation and the application of plastics and predicted their development in the Ukraine in the period 1960-1965.

The articles of N. K. Moshchinskii PhD (chem) from the Dnepropetrovsk Chemico-Technological Institute, "Main Trends in Polymer Synthesis";

L. M. Pesin (NDI Plastics /Scientific Research Institute for Plastics/, Moscow), "Plastics, their Developmental Prospects, Manufacture, and Applications in Government Agencies"; (NDI)

A. M. Kogan (VNDI Coal Machines /All Union Scientific Research Institute for Coal Machine/, Moscow), "Application of Polymers for Heavy Machine Construction";

M. G. Gurarii PhD (technology), "Present Tendencies in Machining of Plastics";

K. M. Vlasov PhD (technology), "Polyamide Plastics in Machine Construction", were heard with great attention.

The papers heard in plenary sessions shed some light on the state of the problems in USSR and abroad, of the manufacture, application, and machining of the most promising plastics.

In the physico-mechanical section, S. B. Ratner (Moscow, NDI Plastics) discussed in his article the properties of plastics, the problems of deformation and destroying of plastics, appraisal of stability to heat and cold, shear viscosity, the study of temperature effect, and the effect of time on the mechanical characteristics of plastics.

In his article, V. F. Yatsenko (Mechanics Institute of the Ukrainian Academy, Kiev) explained research on the strength and the deformativity of plastics, as for example vacuum bound plastic bodies, taking into account a time factor on continuously acting loads and also on an accelerated method for determining the lasting characteristics of strength and deformation. The influence of elevated temperatures on the strength and deformation of the plastic DShL and its determination by means of an idealized structure were discussed in the article of H. I. Dibenko (Mechanics Institute of the Ukrainian Academy, Kiev). P. H. Podchasov (Mechanics Institute of the Ukrainian Academy, Kiev) has suggested a method for the determination of the hardness of plastics. A. M. Kogan (Moscow, VNDI Coal Machines) dealt with the problem of microstructure analysis and also with a method for determining the strength of glass-plastics.

In a number of articles, antifriction properties of plastics were considered, the mechanism of wear and methods of studying wear stability. Further subjects were: the advantages of polyamides obtained from tar over such antifriction melts, as babbit, bronze, cast iron, and others, M. L. Horb and M. D. Sinyavs'ka (Mechanical Institute of the Ukrainian Academy); the role of lubrication of shredded capron (type of nylon) by H. A. Preis and F. P. Pavlik (Technological Institute and Ukrainian Dnieper Transport, Kiev); cushioning characteristics of shredded capron by N. Ya. Kestelman (Technological Institute, Odessa), determination of stability to wear of capron with dry rubbing and sliding by I. P. Zemlyakov (Metallurgical Institute, Dnepropetrovsk), and the influence of technology on the wear characteristics were discussed by P. N. Malishev (Machine Construction Institute, Zaporizhzhya).

The paper of S. B. Ratner (NDI Plastics, Moscow) was devoted to the consideration of mechanism of wear in plastics.

The problems of developing research on plastic fatigue, the analysis of a number of our own and foreign works in this specialty and the studies on fatigue strength of the plastic DShP was the subject of an article by M. I. Chernyak and H. O. Yakovlev (Mechanics Institute of the Ukrainian Academy, Kiev).

In the physico-mechanical section of plastics properties, papers and notices were heard on the application of dilatometry for the control of hardening of resins, the study of the influence of the possibility for normalizing capron products for liquid rubbing and sliding, the application of synthetic membranes for covering surfaces in friction sites, the influence of thermal machining of polyamides on the structure and the properties of the products and so on.

In the section dealing with the application of plastics in technology, the papers were concerned with problems of utilizing plastics in machine construction, aviation, automobile and marine engineering, the electro-technical industry, and other technological branches.

I. Yu. Sheideman (Aviation Institute, Moscow) in his article "Plastics in Aviation Technology" has shown that in aviation technology one can find good use for reinforced plastics, pino-plastics, tri-layer constructions from pino-plastics and glass-plastics, transparent plastics and other. They considered the utilization of glass-locknite and glass-textolite and the formulation of basic requirements for plastics, taking into account, the durability and intermittent thermal stability, stability under vibration, load, chemical inertness, and fatigue strength. Also they considered combinations which could be prepared from plastics.

The problem of using plastics in marine engineering was considered in the paper of V. A. Zamorin, in which it was emphasized that, in marine engineering one finds a wide use for laminated plastics, a fast hardening plastic BKD on a bakelite basis, the Petrov contact and sawdust, phthoro-plastic, chlorinated weave, and others. In marine engineering practice and refitting of ships, we found useful synthetic

glues which provide high strength glue joints.

An engineer K. F. Shafir (VNDI EI, Leningrad) has presented a number of problems on the use of polyamide resins for the production of friction parts in electrical tool manufacture and gave us information on the technology of part manufacture.

Considerable attention was given to the papers of V. D. Bezuhla, A. A. Shturman, and A. N. Mats (The Factory of Dental Materials, Kar'kov) on the compound AST-T, its technical properties and its use in machine building. AST-T consists of polymethyl methacrylate and methyl methacrylate with the introduction of a oxy-hydroxy group, which insures polymerization at room temperature. The composition of AST-T recommends its introduction into for casting products, for the preparation of models, in instrument manufacture, for the preparation of extrusion and elastic stamps, and also as an abrasive material, etc.

The experimental work of using AST-T for the preparation of technological equipment was performed by V. I. Karpin (Khar'kov). He emphasized the fact that the application of AST-T has resulted in an appreciable savings, and permitted a large economies of non-ferrous metals and alloys.

V. N. Limzin (The Bauman Higher Technical School, Moscow) in his article has probed some questions of using plastics in machine building factories of the Moscow Municipal Oblast, and in jobs of the plastics laboratory of the Bauman Higher Technical School. In this laboratory one constructs automated machines for the tearing and pelletizing of threadlike plastics, equipment for automatic pressing, the packing of parts, hydraulic presses, an automated machine for pressing thermosensitive plastics by the pouring method into the form and so on. In the laboratory one works out the methods of measuring the tolerances of parts made of plastics, instruments for quality control of products, suitable materials for the design of presses.

In the section for applying plastics in technology, papers and notices were read on the application of polyamides in machine manufacture and on the application of rubber and plastics in protecting the hulls of marine vessels from a wave action, and on the application of plastics in the farming machine industry and so on.

In the section on methods and equipment for the machining of plastics, we heard an article by Z. A. Mitskevich, V. F. Shahinyan and Yu. A. Kahn (NDI, Kiev), which was devoted to the problems of the effect of machining methods on the physico-mechanical properties of capron, the relation of the machining region to fatigue viscosity, and the study of optimal conditions for preparing parts. A worker of the same institute, B. Ya. Ketslah, has considered the problems connected with the coating of parts of bearing packings with carbon. He showed that this ensures the stability of the inside dimensions, the possibility of work at higher velocities on normal and close-to-fatigue pressure, the quality of parts, and an appreciable decrease in the wear of capron.

A. B. Hredeskul (Automobile and Road Institute, Kharkov), in his article on the fundamentals of analyzing working conditions of the

separate joints of a car, taking into account the physico-mechanical properties of capron, quoted a list of parts which should be made of capron.

N. N. Samosats'kii (Okhtins'kii Chemical Combine, Leningrad) has set forth the experience of the Combine in the manufacture of plastics into products. An analysis of the conditions of workability on raw materials into products, by which one ensures the optimal physico-mechanical and utilization features, was covered by the article of I. F. Konovets (NDI Plastics, Moscow). D. V. Dzhuhalenko (the Factory "Precision Electrical Tool", Kiev) explained a project for standardizing the preparation of parts from plastics. D. M. Buryakivs'kii from the same factory, gave information on the problems of automation of processes for pressing plastic parts. V. I. Tarakanov (VNDIEP, Leningrad) discussed in his article the peculiarities of making parts from polyamide resins, the properties of construction in pouring forms under pressure, and of fast machines for the working of polyamides and also the technology of manufacture of tooth gears. K. A. Akunets (Electrical Machinery Construction Plant, Riga) has given the construction and technology for manufacturing collectors for electrical machinery built on a "nesuchiy" plastic body.

In the section on methods and preparation of the working of the plastics, there were also articles and notices on the problems of building and introducing new automatic machines for thermoplastics, on the experience of the plant "Kommunar" (Zaporizhzhya) on the working of capron into products, on the analysis of foreign equipment and methods for working plastics, and on the properties of working threads, glass-plastics, pino-plastics, etc.

In the Kiev building for scientific-technical propaganda, there was an exhibition for the members of the conference, which contained examples of plastics, which are manufactured in Ukrainian SSR, machine parts and tools made from plastic.

The exhibition was organized by 23 industries from the Kiev, Dniepropetrovsk, L'viv, Kharkov, Odessa, and Stalino regions and a number of scientific research institutes. Trips to plants in the Kiev region were organized for the participants of the conference. Here the members became acquainted with the fabrication of products from capron, the technology of parts manufacture from plastics, and the equipment necessary for manufacturing plastic products. The conference made recommendations of a scientific-technical and organizational nature, which, strongly favor a further introduction of plastics into the machine and tool industry.

The conference stressed that many Ukrainian scientific-research institutes has conducted and is conducting research in the area of constructing new plastics, the working of plastics into products, the construction of parts from plastics for the machine industry, and the studying of their performance. Also, the institutes investigate the strength and deformation of plastics while they are under loaded conditions, at normal conditions, and at elevated temperatures, they

study the physico-mechanical characteristics of plastics and work out methods of their determination, together with the study of antifriction properties of polyamides. In the projects enumerated above the following agencies take part: the Institute of Monomer and Polymer Chemistry of Ukrainian Academy, Mechanics Institute of Ukrainian Academy, Scientific-Research Institute of City and Fuel Industry of the State Institute of Planning of the Ukraine, Dniepropetrovsk Chemicotechnical Institute, "Ukraioproshlyakhtrans," Zaporizhzhia Machine Building Institute, Kiev Polytechnical Institute, Khar'kov Automobile and Road Institute, and other scientific-research and school institutes.

The conference said that the work which is conducted by the scientific-research institutes does not adequately meet the increasing needs of the industry, especially in the area of determining the physico-mechanical properties of plastics, and the manufacture of plastic into products.

In connection with ensuring that plastics shall become widely introduced in machine and tool industry, the conference recommended the rapid increase of the manufacture of special materials suitable for pressing, with bases phenol formaldehyde and carbomide resins, polyethylene, high strength plastics of the type SVAM, AG-4, SNP, FKP, PKND, silicon-organic polyether and epoxide resins, powdered materials for coating metal surfaces, self-hardening plastics, AST-T, and others; also one should undertake to increase the industrial output in the Kiev and Odessa regions by providing machines for making plastic products (extrusion machines) in which there should be a number of laboratory-type machines. The conference recommends the creation, at the Ukrainian Academy, of branch institutions devoted to scientific research, design and construction, institutes of higher learning, and factory laboratories. In the area of new plastics manufacture, the conference recommended a diversified study of the basic properties of plastics, the working out of methods for designing and constructing parts and forms from plastics, the planning of time and motion studies for the production of finished products, the construction of new means for preparing plastics manufacture and for making finished products, and the investigation of new areas for applying plastics in the machine and tool industry.

The conference regards as rational the undertaking of extensive research into the physico-mechanical properties of plastics, especially the investigations of durability and fatigue strength of plastics, the influence of time, temperature, loading, and the environmental conditions and also the effect of aging on the physico-mechanical properties of plastics. It is necessary to develop methods for studying durability, strength, deformation as a function of time, fatigue studies on repetitive, variable loading, with different cycle asymmetry coefficients and tearing strength studies.

In connection with the studies on physico-mechanical characteristics, development should proceed in the direction of increased research on strength, taking into account the scale factor and the

form factor, together with the method of data determination for estimating the constructional strength of plastic products. In order to establish computation methods for finding the strength and the deformation of machine parts, it is necessary to make an effort to construct a theory of plastic materials strength, e.g. vacuum bound plastics, taking into account anisotropy, time, temperature, environmental conditions, and the method of processing, and to be aware of calculation methods elsewhere.

It is necessary to initiate diversified research into the anti-friction properties of plastics, and especially to perform an analysis of the nature of dry rubbing of two plastics, a plastic and a metal, and to infer the functional relation of frictional forces from the physico-mechanical characteristics of plastics. Moreover, it is necessary to develop methods of determining resistance to wear and to notify the respective GOST. (All Union State Department of Standards).

Great attention should be given to the study of synthetic liquids and their affinity with metal surfaces.

In the area of solving construction problems, it is necessary to increase to a large extent the research in welding and glueing plastics. In this endeavor one should include the scientific-research institutes, higher schools, factory laboratories, and primarily the Mechanics Institute of Ukrainian Academy, the Ye. O. Paton Institute of Electrical Welding of Academy, Kiev Polytechnical Institute, Kiev and Kharkov Automobile and Road Institutes, the Odessa Technological Institute, the Dniepropetrovsk Metallurgical Institute, the Dniepropetrovsk Tube Institute, Zaporizhzhia Machine Construction Institute, the NDI for the State City Planning Authority of the Ukrainian SSR, and others.

In addition to research on new applications of plastics which are already known, it is necessary to conduct scientific research for constructing new high tensile strength and thermal stability plastics, and also plastics with high antifrictional characteristics.

These works should be conducted in the Institute of Monomer and Polymer Chemistry of the Ukrainian Academy, NDI Plastics (Stalino) and others.

It is imperative to extend the design and output of machines which manufacture plastic goods, utilizing domestic or foreign experience. In the Ukrainian SSR this work is being conducted by the NDI Plastics (Kiev), design institutes and factories.

The conference thinks that an important role in the development of plastics manufacture and the manufacture of plastic goods has been played by scientific seminars, vocational schools, the propaganda of new achievements by means of a systematic press coverage of the most important works.

In order to solve the problems which present themselves, it is necessary to concentrate the efforts of the specialists in the direction of work which has a high priority at this time; it is necessary to provide a coordination of research and to create in the

Ukrainian SSR a number of scientific-research units.

Thus the conference recommended that in order to intensify the work in the study of physico-mechanical properties of plastics, there should be created in Kiev at the Institute of Mechanics of Ukrainian Academy, a laboratory specially equipped to investigate plastic strength, for the study of cold hardening plastics and the building of a new laboratory in Kharkov, etc.

The Republic Scientific-Technical Conference on problems of applications of plastics in machine building and tool construction has proceeded on a high level. Another conference shall take place in 1961.

In order to acquaint a wide circle of scientific and engineering workers with the work of the conference during the year 1960, the proceedings of the conference shall be published, which shall contain most of the papers and notes.

COORDINATING COUNCIL ON THE PROBLEMS OF DIVERSIFIED EXPLOITATION
OF FUEL AND ENERGETIC RESOURCES OF THE UKRAINIAN SSR.

Following is a translation of an Ukrainian article by
Ch. Meitin in Dopovidi AN URSR, No 7, Kiev, 1960,
pp. 993-995.7

The leading organs of the Ukrainian Academy coordinate the research conducted in the scientific-research institutes of the Republic, higher schools and planning organizations, which deals with the problem of the diversified utilization of hard fuels and the submitting of proposals for the improvement of exploiting fuel on a nationwide scale, and also introduces the results of the research into the practice of socialist production.

In March, 1960, the council for the study of production strengths of the Ukrainian SSR, of the Ukrainian Academy, together with the thermoenergetic institutes of the Ukrainian Academy, began the coordinated discussion on the above problem. Taking part in the activities of the council were the representatives of the USSR Academy of Science, the State Scientific-Technical Committee of the Council of Ministers of the Ukraine, the State Institute of Planning of the Ukraine, branch scientific-research institutes, higher schools, planning institutes, and industries from Moscow, Kiev, Kharkov, L'viv, Stalino, Dnepropetrovsk, Lugans'k, Chernivtse.

During the session, papers were read on the general problems of energetics, and thermal and chemical utilization of fuel.

Of particular interest were the articles of the representative of the State Institute of Planning of Ukrainian SSR, N. A. Dubovik, "On Fundamental Indicators of the Tentative Plan of Development for the Fuel Industry in Ukrainian SSR during the 1959-1980 Period"; the corresponding member of USSR Academy of Science, M. M. Karavayev, "Fuel as the Raw Material for the Chemical Industry"; the senior scientific co-worker of the Institute of Fuel Mines of the USSR Academy of Science, L. S. Semenov "Economic Effectiveness of the Utilization of small size Fuel Coal by the Method of Continuous Coal Coking" and also the paper of the senior scientific worker of the Institute of Thermoenergetics of the Ukrainian Academy, S. U. Landsman "Economical Effectiveness of Energo-Technical Exploitation of Gas Coal of the Donbas".

In addition to the scientific articles, the council also heard the news of the accomplishments in the area of exploiting fuel energy resources of the Ukraine, for the year 1959, the coordinating of plans for scientific research works on the problems for the year

1960 and the discussion of basic directions for scientific research on the problems and aspects of the overall future picture.

Scientific research during 1959 was conducted in these fundamental directions:

- 1) perfection of old methods of dry distillation of coal, and development of new ones;
- 2) varied energo-technological utilizations of black and brown coal of the Ukraine;
- 3) research into chemical methods of utilizing black and brown coal and, the method of obtaining new products.
- 4) utilizing the products of thermal processing of coal
- 5) studies of the physico-chemical properties of Ukrainian coal
- 6) the utilization of secondary energy sources and industries.
- 7) the preparation of scientific plans for the fuel and energy balance of the Ukraine and separate economical regions.

The council stressed those most important works carried out in these directions during 1959:

- a) research on energo-technological use of gas and large size coal of the Donbas, which shall be used for the experimental-industrial plant in Stalino for the testing of low grade coal of the Donbas (the Institute of Thermo-Energetics of the Ukrainian Academy);
- b) research on the preliminary data for the design of a coke-gas-chemical factory (the Ukrainian Scientific-Research Institute of Coal Chemistry);
- c) investigation into the quality of coal from Western Donbas, the result of which shall establish the possibility of using this coal as supplement to the coal used in smelting for the production of metallurgical coke and for a starting material for energo-technological uses (Dniepropetrovsk Chemico-Technological Institute);
- d) compiling a tentative future balance of coal production and its consumption for the Donbas coal, and their characteristics from physico-chemical properties, (Donets' Coal Institute);
- e) compiling a scientific plan for the fuel-energetic balance of the Ukraine and separate economical regions (the Institute of Thermo-Energetics of the Ukrainian Academy).

However, in addition to the achievements in the research which has been done, there were also these important shortcomings: in research on the thermal processing of fuels, the method of high temperature coking predominated and other methods were neglected; energo-technological methods of utilization of solid fuels were not sufficiently developed; the stopping of work in the experimental-industrial plant on energo-technological processing of brown coal in Oleksandria, disregarded the fact that this plant is important not only for the research on thermal processing of the Ukrainian brown coal, but also for the research on similar coal of other coal basins of the USSR and countries of people's democracies; the works conducted on the diverse utilization of coal in fluidized condition and the problems of processing combinations for fuel utilization have been conducted unsatisfactorily; in the working out of directives on the problems which

require the participation of several different branches of sciences, and above all, the work programs were not submitted which would delegate the role and the location of the separate research groups, etc.

The council has discussed and praised the plan of scientific-research works on the problems for the year 1960, which is directed at accelerating the technical progress in fuel utilization and the solution of problems which are confronting the scientists on the diverse utilization of solid fuels in the Republic. The text of the program of work for 1960 there are the following questions: energo-technological utilization of fuel; the design of methods for continuous coking for the production of non-metallurgical coke; the design of a new optimal scheme for a coke-chemical plant; a sensible exploitation of fluidization equipment for the diverse utilization of solid fuel; the design of a method for a direct production of chemicals from coal itself.

The main objective of scientific research in 1960 is to study the physico-chemical properties of Ukrainian coal, to design new and assimilate existing methods of varied coal utilization with the method of obtaining valuable chemical products, coke, and energetic fuel.

The above-mentioned program also includes a number of theoretical studies which deal mostly with the thermal processing of fuel.

In the year 1960 the technico-economical studies in the area of multiple utilization of solid fuels of the Ukraine shall be increased.

According to the coordination plan for 1960, the work is undertaken by 20 establishments, amongst which, 5 are institutes of Ukrainian Academy, 4 are scientific-research branch institutes, 6 of them are higher schools, and the other 6 are design and manufacturing organizations.

The leading organs in the programming of research are the Thermo-Energetic Institute of Ukrainian Academy and the Ukrainian Scientific-Research Institute of Coal Chemistry.

Having discussed the papers and the plans for scientific investigations in 1960, the council adopted the following resolutions:

- 1) to form a committee which would concern itself with the problem of the complex utilization of fuel in the republic after having studied the production capacity of Ukraine and worked out a plan for the separate research areas and to include the scientific establishments, higher schools, design and manufacturing organizations for the task of working out the overall program;

- 2) to recommend to the Ukrainian Scientific-Research Institute of Town and Fuel Industry to anticipate the development of research for increasing the range of conventional fuels and their optimal rational utilization;

- 3) to ask the Dniepropetrovsk municipality and the State Institute of Planning of Ukraine to undertake the building of a research-industrial plant for the manufacture of a calcium-ash cement on an ash basis of the Pridnieprov GES;

4) recommend to the Council on the Study of the Productivity Potential of the Ukraine that it should, together with the Thermo-Energetic Institute of the Ukrainian Academy, State Planning Institute of the Ukraine, DNTK of the Council of the Ministers of the USSR, and the respective municipalities, to organize in the last quarter of 1960 a large scientific conference devoted to the problems of the diverse utilization of solid fuel in the USSR.